404P0281

F I G. 1 A REQUESTED DISPLAY
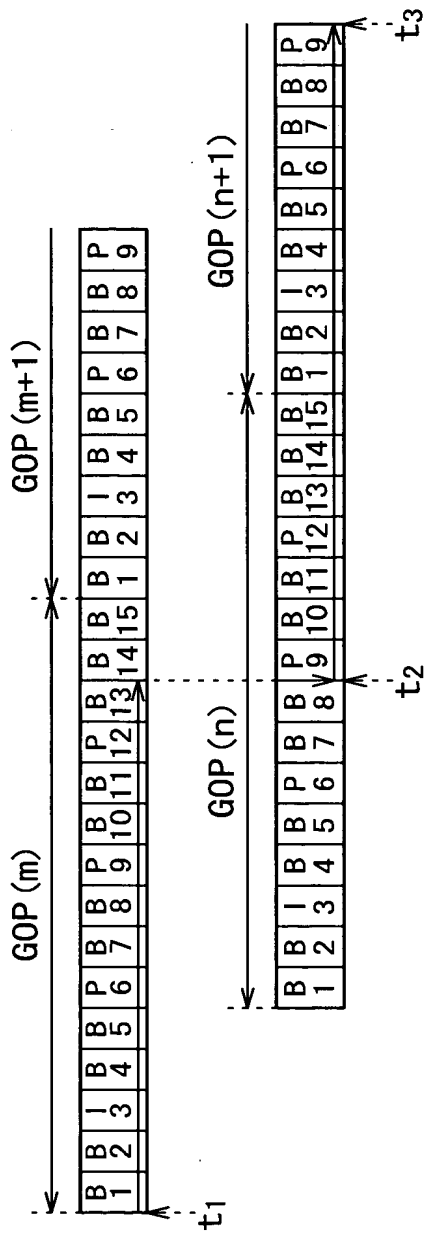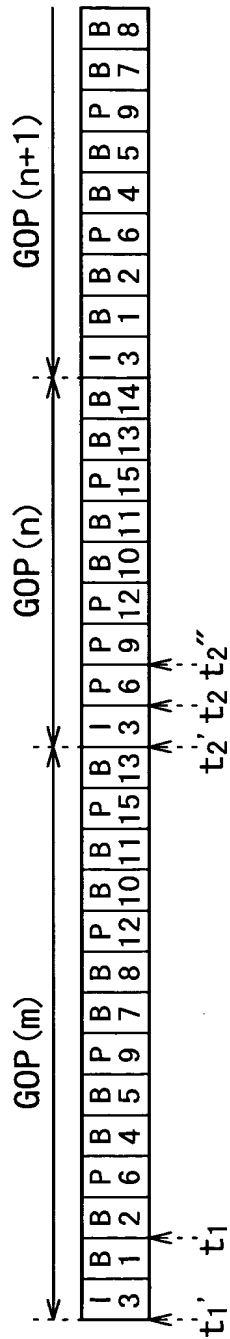
GOP (m) GOP (m+1)

GOP (n) GOP (n+1)

t_1 t_2 t_3

F I G. 1 B DECODING

GOP (m) GOP (n) GOP (n+1)

t_1' t_1 t_2' t_2 t_2''

F I G. 1 C ACTUAL DISPLAY
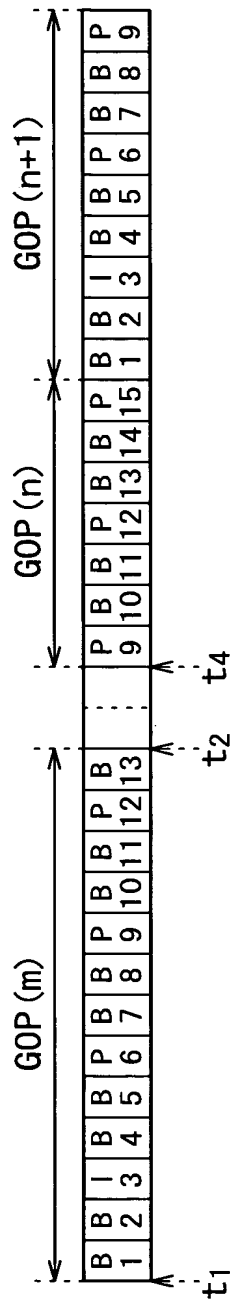
GOP (m) GOP (n) GOP (n+1)

t_1 t_2 t_4

FIG. 2
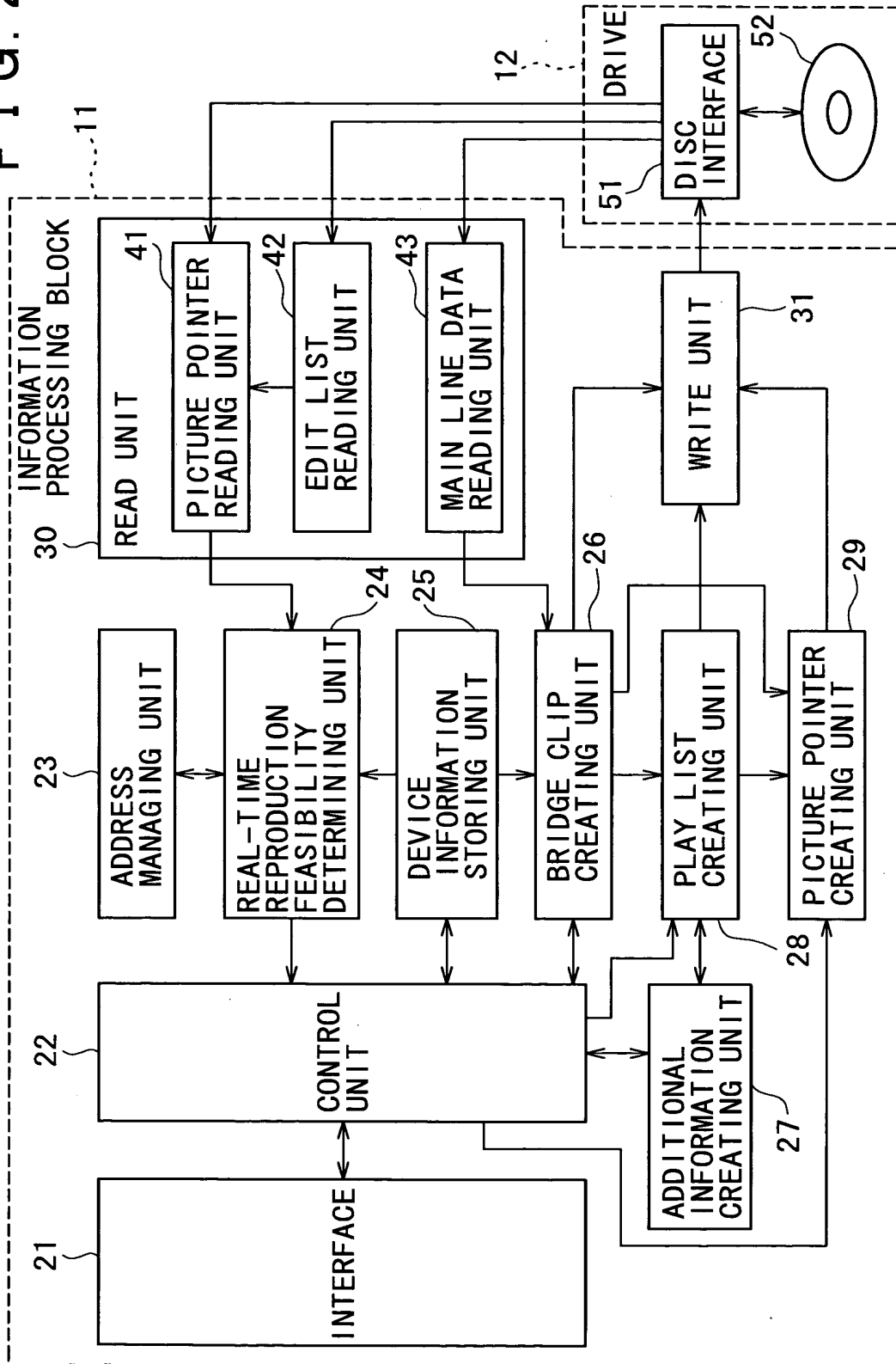
FIG. 3A
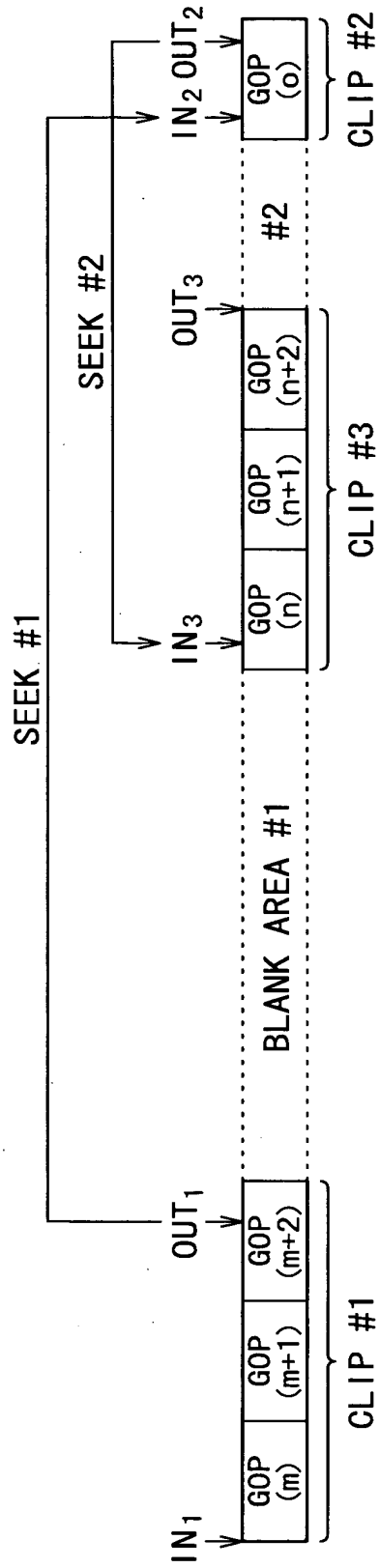
FIG. 3B
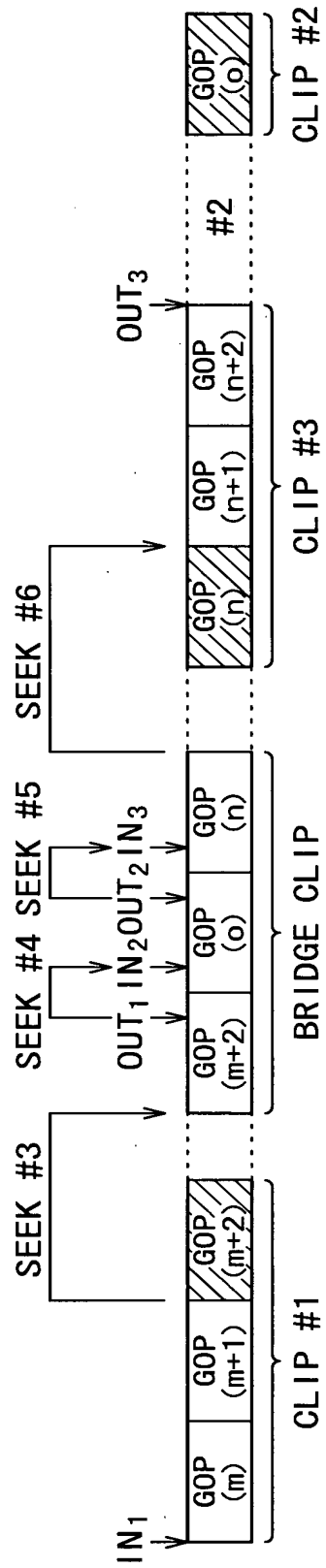
FIG. 4

EDIT LIST

ORDER OF REPRODUCTION	TIME CODE (IN)	TIME CODE (OUT)
1	$TC(IN_1)$	$TC(OUT_1)$
2	$TC(IN_2)$	$TC(OUT_2)$
3	$TC(IN_3)$	$TC(OUT_3)$

F I G. 5
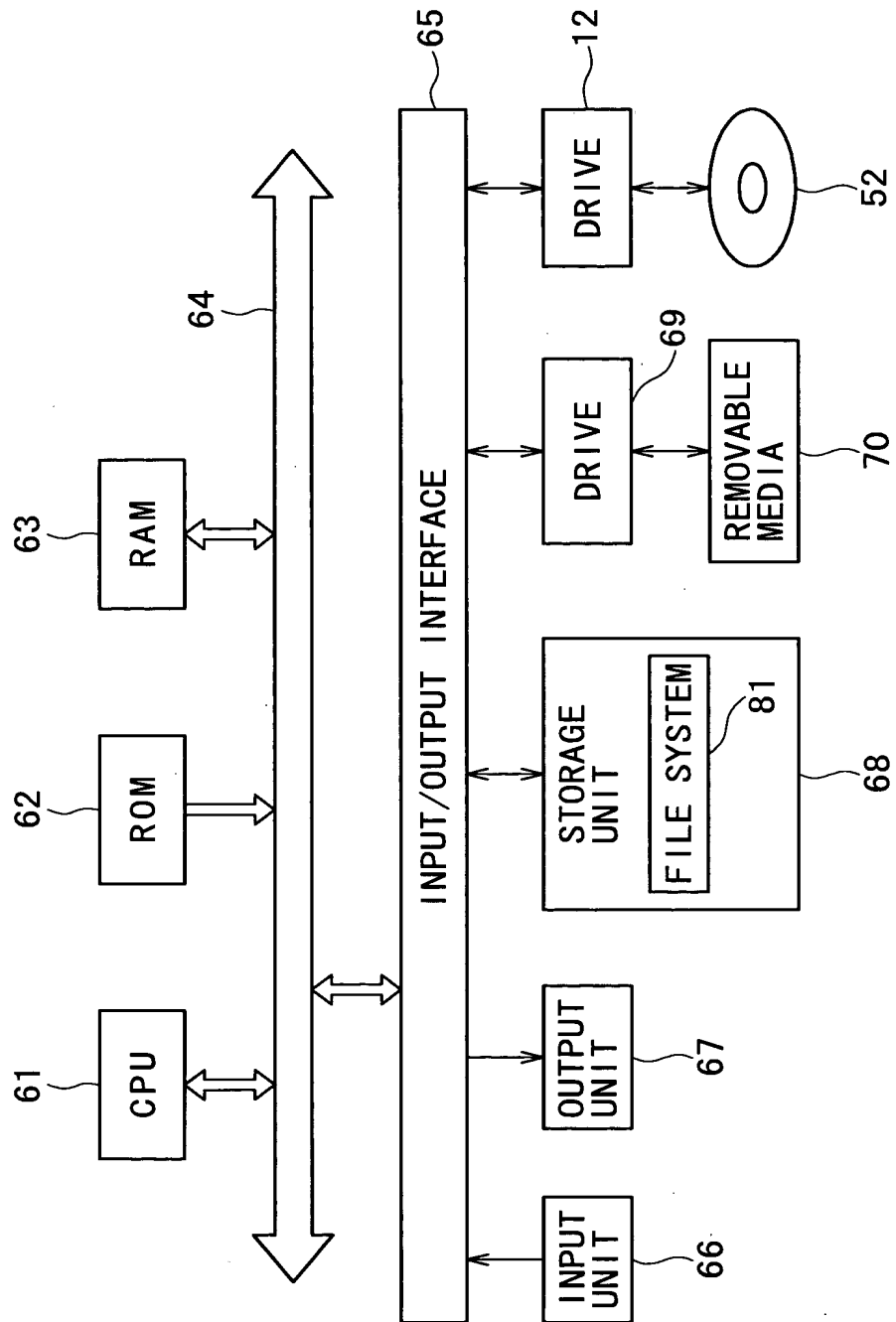
FIG. 6
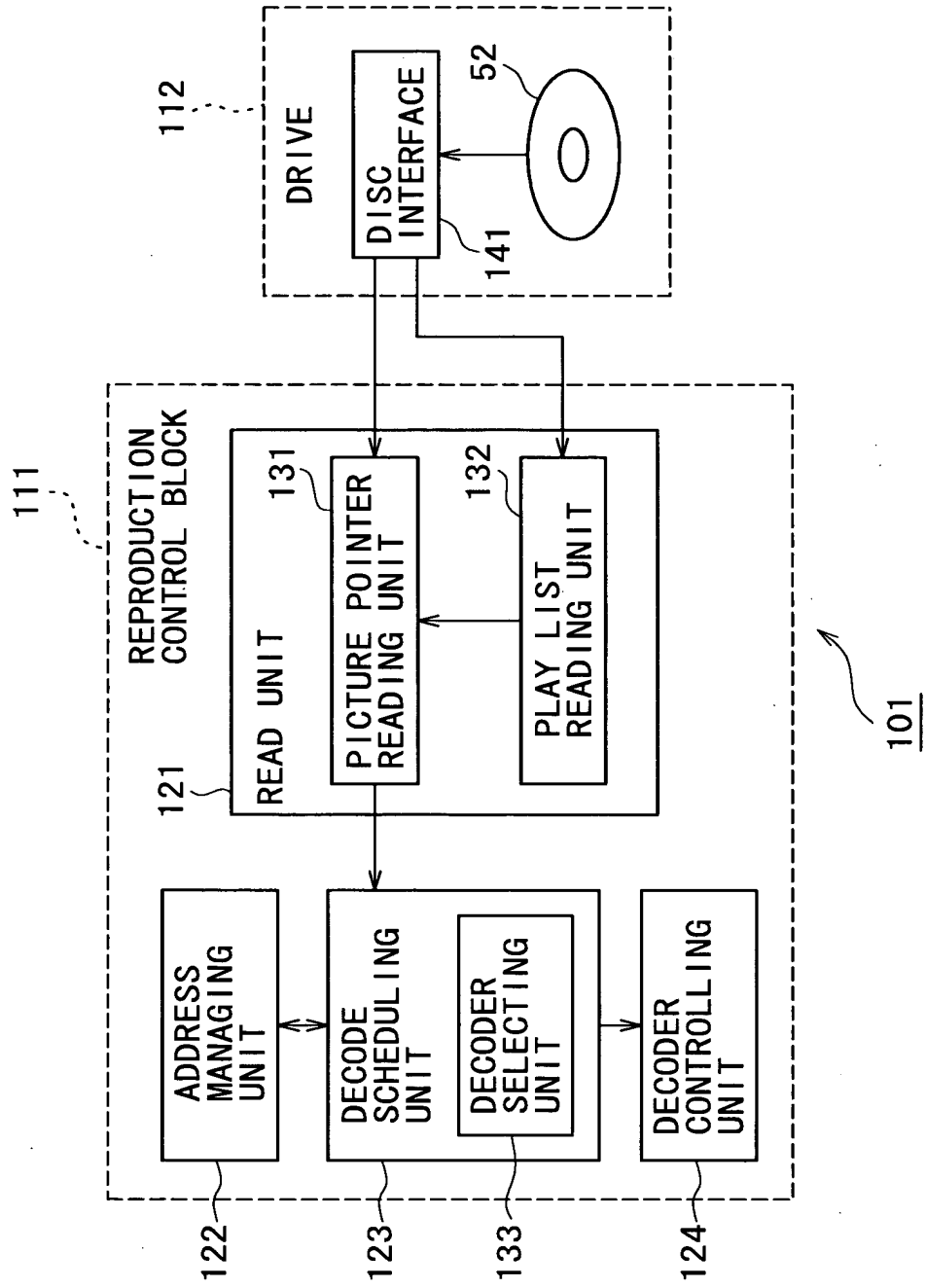
F I G. 7
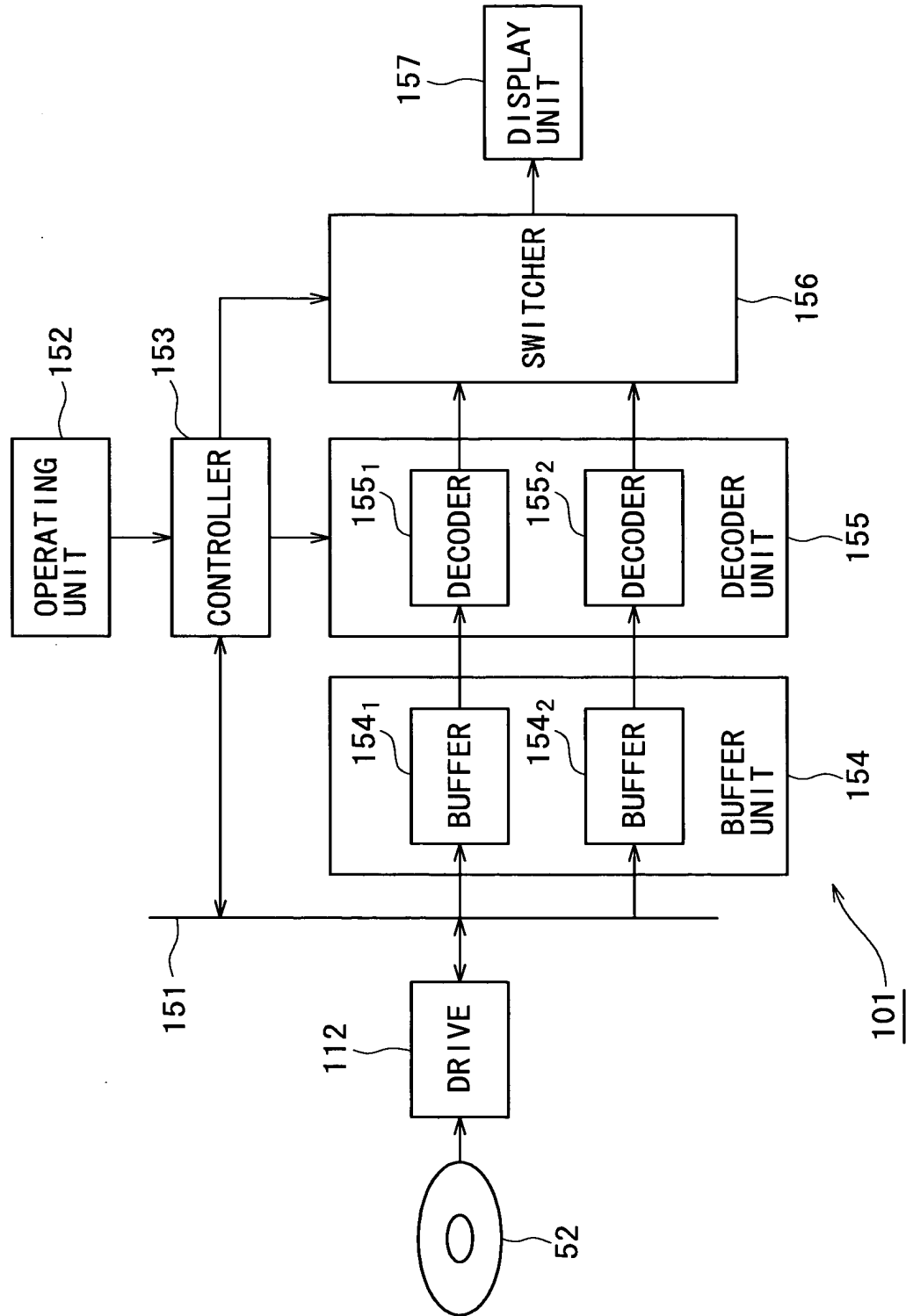
FIG. 8

PICTURE WITH EDIT POINT	PICTURE SEQUENCE
B1	GOP(n-1) {I3, P6, P9, P12, P15}, GOP(n) {I3, B1, B2, P6, B4···
B2	GOP(n-1) {I3, P6, P9, P12, P15}, GOP(n) {I3, B2, P6, B4···
I3	GOP(n) {I3, P6, B4, B5, P9, B7, B8, P12, B10, ···}, ···
B4	GOP(n) {I3, P6, B4, B5, P9, B7, B8, P12, B10, ···}, ···
B5	GOP(n) {I3, P6, B5, P9, B7, B8, P12, B10, ···}, ···
P6	GOP(n) {I3, P6, P9, B7, B8, P12, B10, ···}, ···
B7	GOP(n) {I3, P6, P9, B7, B8, P12, B10, ···}, ···
B8	GOP(n) {I3, P6, P9, B8, P12, B10, ···}, ···
P9	GOP(n) {I3, P6, P9, P12, B10, ···}, ···
B10	GOP(n) {I3, P6, P9, P12, B10, B11, P15, B13, B14}, ···
B11	GOP(n) {I3, P6, P9, P12, B11, P15, B13, B14}, ···
P12	GOP(n) {I3, P6, P9, P12, P15, B13, B14}, ···
B13	GOP(n) {I3, P6, P9, P12, P15, B13, B14}, ···
B14	GOP(n) {I3, P6, P9, P12, P15, B14}, ···
P15	GOP(n) {I3, P6, P9, P12, P15}, ···

9/36

FIG. 9A DISPLAY

GOP (m−1), GOP (m)   GOP (n)   GOP (m+2)   GOP (m+3)

... B B P B B I B B P B B I B B P B B I B B P B B P B B P B B I ...
13 14 15 1 2 3 4 5 6 1 2 3 4 5 6 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 1 2 3

OUT₁ | IN₂   OUT₂ | IN₃

DISPLAY TIME t_n DISPLAY TIME t'_n

FIG. 9B DECODER 155₁

GOP (m−1), GOP (m)

... P B B I B B P B B
15 13 14 3 1 2 6 4 5

t_{n-8} t_{n-2}

GOP (m+1), GOP (m+2)   GOP (m+3)

I P P P I B B P B B P B B I B B
3 6 9 12 15 3 1 2 6 4 5 9 7 8 12 10 11 15 13 14 3 1 2

t'_{n-7} t'_{n-2} t'_n

FIG. 9C DECODER 155₂

GOP (n−1), GOP (n)

I P P P I B B P B B
3 6 9 12 15 3 1 2 6 4 5

t_{n-7} t_{n-2} t_n

FIG. 9A

FIG. 9B

FIG. 9C

F I G. 1 0

GOP (n-1)

GOP (n)

| P | B | B | P | B | B | I | B | B | P | B | B | P | B | B | P | B | B | P |
|12 |13 |14 |15 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |10 |11 |12 |13 |14 |15 |

Nip=6

Nip=1

Nip=2

Nip=3

Nip=4

Nip=5

| B | B | I |
| 1 | 2 | 3 |

DISPLAY

F I G. 1 1

CLIP B

P(n)

CLIP A

CLIP C

EDIT POINT n−1
=EP(n−1)

EDIT POINT n
=EP(n)

THE NUMBER OF I AND P PICTURES IN
THIS PORTION IS REPRESENTED BY Nip

FIG. 12

```
( START PLAY LIST CREATING PROCESS )
              │
              ▼
┌─────────────────────────────────────┐ S1
│ READ EDIT LIST FROM OPTICAL DISC    │
│ AND INTERPRET THE RETRIEVED LIST    │
└─────────────────────────────────────┘
              │
              ▼
┌─────────────────────────────────────┐ S2
│ READ PICTURE POINTERS FOR CLIPS     │
│ TO BE REFERENCED IN EDIT LIST       │
└─────────────────────────────────────┘
              │
              ▼
┌─────────────────────────────────────┐ S3
│ CONVERT LOGICAL ADDRESSES TO        │
│ PHYSICAL ADDRESSES                  │
└─────────────────────────────────────┘
              │
              ▼
┌─────────────────────────────────────┐ S4
│ DETERMINE FEASIBILITY OF            │
│ REAL-TIME REPRODUCTION              │
└─────────────────────────────────────┘
              │
              ▼
        ╱─────────────────╲  S5
       ╱  ANY BRIDGE CLIP   ╲
      ╱ NEEDED TO BE CREATED? ╲──── NO ────┐
       ╲                      ╱            │
        ╲────────────────────╱             ▼
              │                   ┌──────────────────┐ S15
             YES                  │ UTILIZE EDIT LIST│
              │                   │ AS PLAY LIST     │
              ▼                   └──────────────────┘
┌──────────────────────────────┐ S6         │
│ DETERMINE LOCATIONS WHERE     │            ▼
│ BRIDGE CLIPS ARE TO BE        │          ( 2 )
│ CREATED                       │
└──────────────────────────────┘
              │
              ▼
┌──────────────────────────────┐ S7
│     CREATE BRIDGE CLIPS       │
└──────────────────────────────┘
              │
              ▼
        ╱─────────────────────────╲ S8
       ╱ BRIDGE CLIPS CREATED FOR   ╲──── NO
       ╲ ALL LOCATIONS?            ╱
        ╲─────────────────────────╱
              │
             YES
              │
              ▼
            ( 1 )
```

F I G . 1 3

①

CREATE PICTURE POINTERS FOR BRIDGE CLIPS — S9

MODIFY EDIT LIST INTO PLAY LIST SO THAT REPRODUCTION IS PERFORMED IN REFERENCE TO BRIDGE CLIPS — S10

②

NO ⟨ ADDITIONAL INFORMATION NEEDED ? ⟩ S11

YES

PERFORM ADDITIONAL INFORMATION CREATING PROCESS — S12

CREATE PICTURE POINTERS FOR CLIPS TO BE REFERENCED IN PLAY LIST — S13

WRITE PLAY LIST AND PICTURE POINTERS TO OPTICAL DISC — S14

END

FIG. 14

```
 1:  <body>
 2:      <par>
 3:          <!-- Clip1 -->
 4:          <ref src=" urn:smpte:umid:XX...VA"
 5:              clipBegin="smpte=00:00:00:00" clipEnd="smpte=00:05:00:12" />
 6:          <!-- Clip2 -->
 7:          <ref src=" urn:smpte:umid:YY...VA" begin="smpte=00:05:00:12"
 8:              clipBegin="smpte=00:02:00:00" clipEnd="smpte=00:02:00:10" />
 9:          <!-- Clip3 -->
10:          <ref src=" urn:smpte:umid:ZZ...VA" begin="smpte=00:05:00:22"
11:              clipBegin="smpte=00:10:00:03" />
12:      </par>
13:  </body>
```

FIG. 15

LISTED ORDER (DISPLAY ORDER FRAME NO.)
1, TOP OF GOP; 0, OTHERS
top_field_first
repeat_first_field

picture type 001:I picture
010:P picture
011:B picture
000 D (dummy) others are reserved

				Size	picture type	File Address
#0	1			··	B	··
#1	0			··	B	··
#2	0			··	I	··
	0			··	B	··
	0			··	B	··
	0			··	P	··
	0			··	··	··
	··			··	··	··
	··			··	··	··
	··			··	··	··
	··			··	··	··
	··			··	··	··
#n	0			··	P	··

3 bits | 21 bits (Max:2 Mbytes) | 3 bits | 37 bits (Max:137 Gbytes)

3 bytes | 5 bytes

8 bytes

FIG. 16

FIG. 17

F I G. 1 8
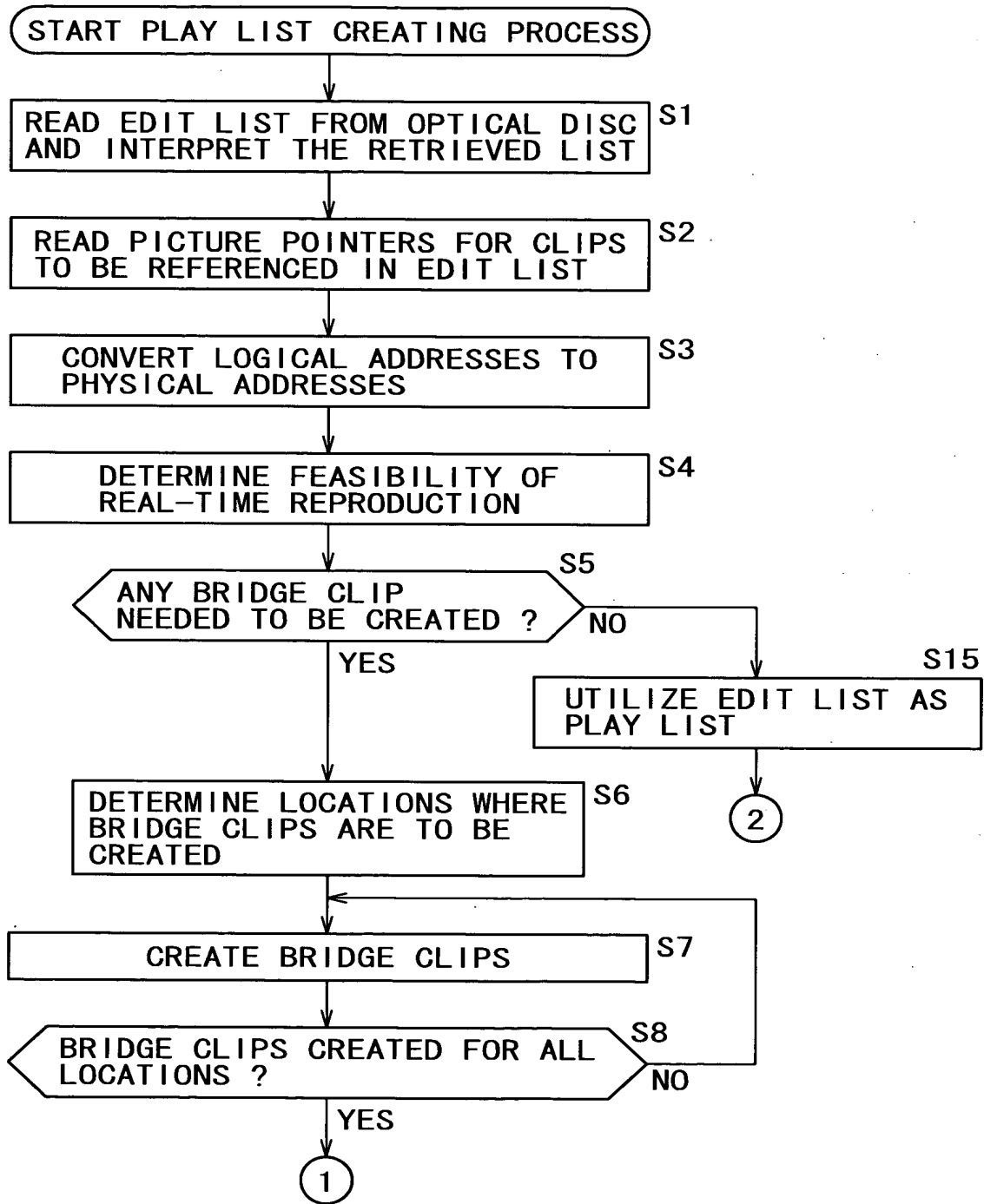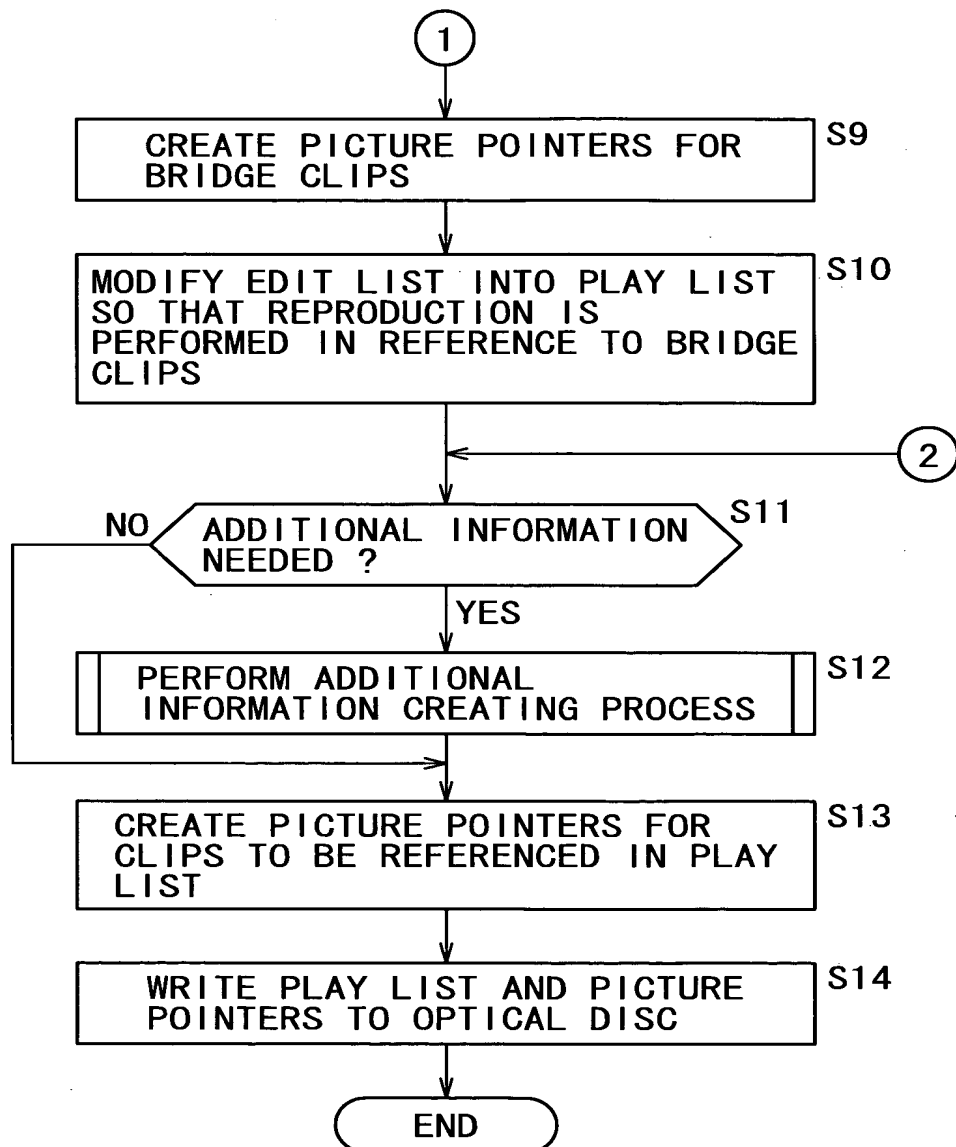
```
 1:  <body>
 2:    <par>
 3:      <!-- Clip1 -->
 4:      <ref src= "urn:smpte:umid:xx...VA"
 5:        clipBegin=" smpte=00:00:00:00"  clipEnd="smpte=00:05:00:00" />

 6:      <!?-- Bridge Clip -->
 7:      <ref src= "urn:smpte:umid:AA...VA"  begin=" smpte=00:05:00:00"
 8:        clipBegin=" smpte=00:00:00:00"  clipEnd="smpte=00:00:00:12" />
 9:      <ref src= "urn:smpte:umid:AA...VA"  begin=" smpte=00:05:00:12"
10:        clipBegin=" smpte=00:00:00:17"  clipEnd="smpte=00:00:00:27" />
11:      <ref src= "urn:smpte:umid:AA...VA"  begin=" smpte=00:05:00:22"
12:        clipBegin=" smpte=00:00:01:03"  clipEnd="smpte=00:00:01:14" />

13:      <!-- Clip3 -->
14:      <ref src= "urn:smpte:umid:ZZ...VA"  begin=" smpte=00:05:00:33"
15:        clipBegin=" smpte=00:10:00:15" />
16:    </par>
17:  </body>
```
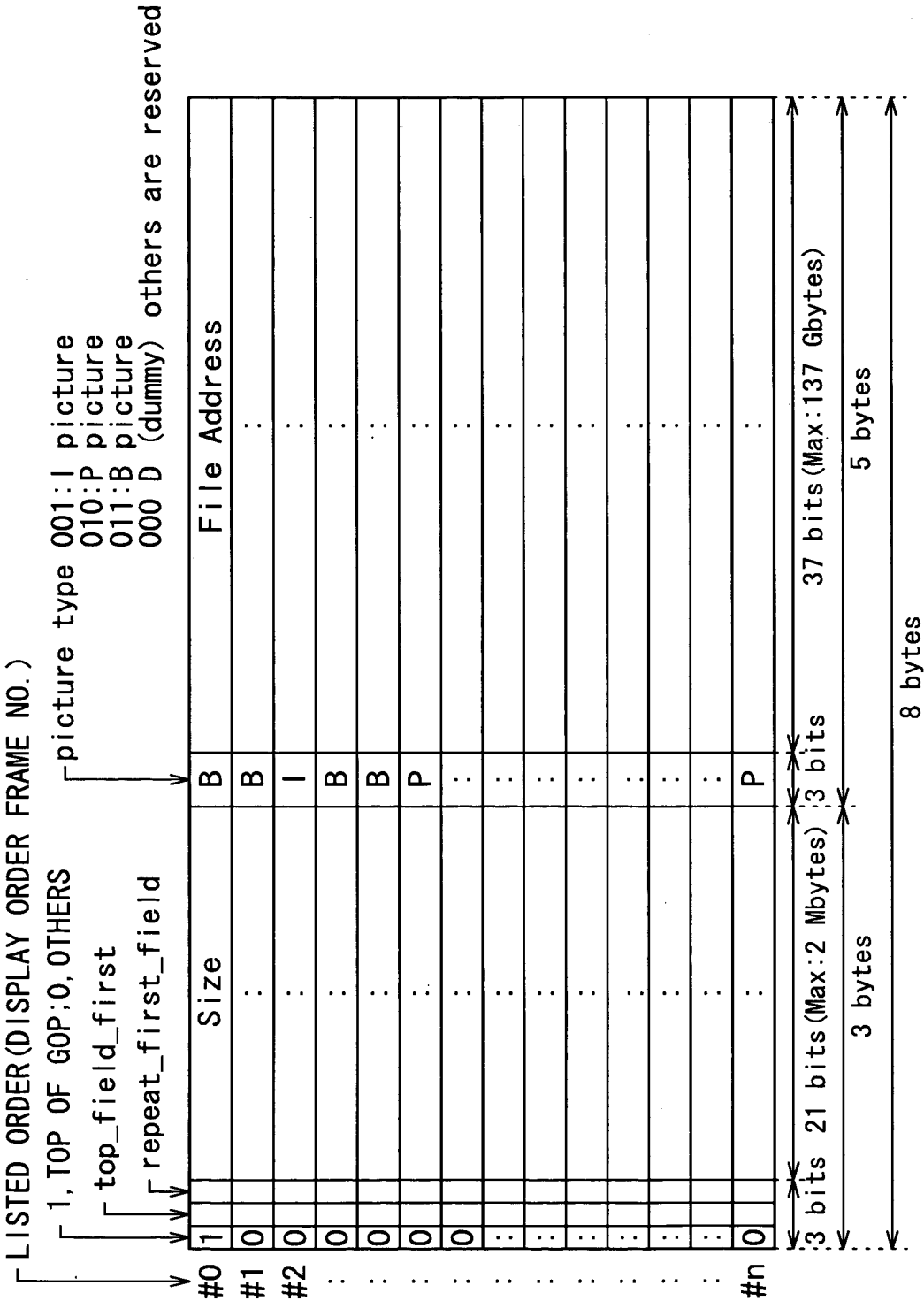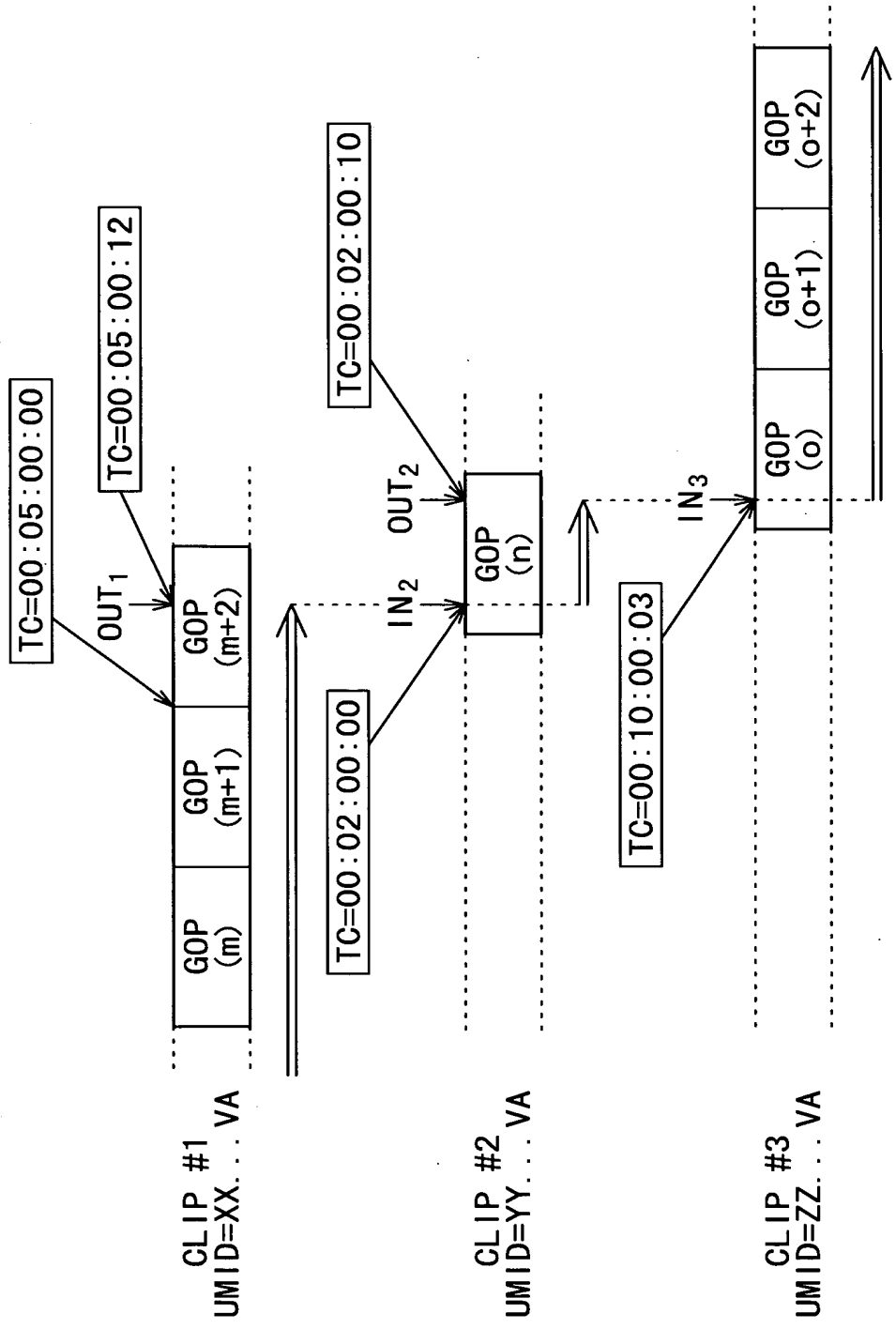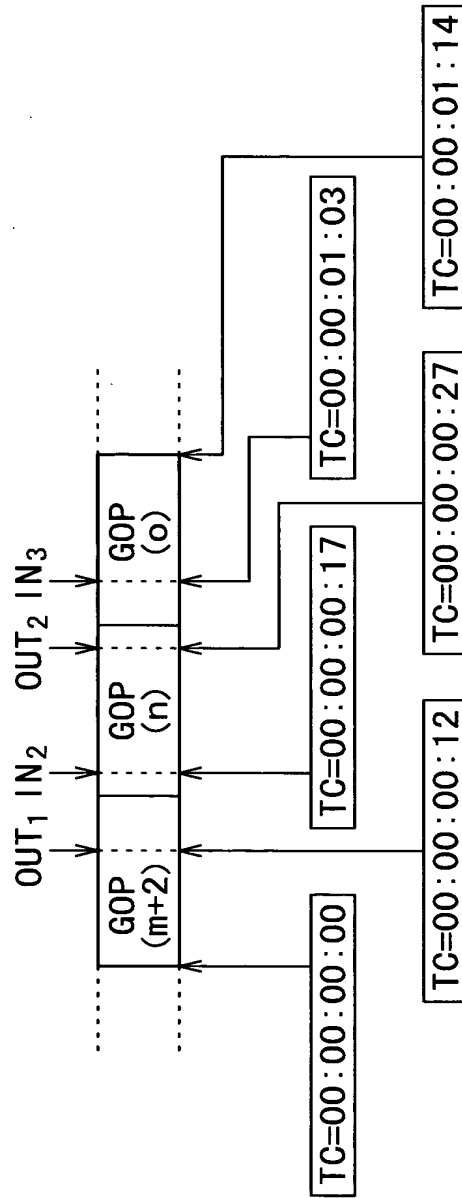
FIG.19

```
 1: <body>
 2:   <par>
 3:     <!-- Clip1 -->
 4:     <ref src= "../0001/video01.mpg"
 5:       clipBegin=" smpte=00:00:00:00"  clipEnd="smpte=00:05:00:00"  />

 6:     <!?-- Bridge Clip -->
 7:     <ref src= "../../Edit/0002/video02.mpg" begin=" smpte=00:05:00:00"
 8:       clipBegin=" smpte=00:00:00:00"  clipEnd=" smpte=00:00:00:12"  />
 9:     <ref src= "../../Edit/0002/video02.mpg" begin=" smpte=00:05:00:12"
10:       clipBegin=" smpte=00:00:00:17"  clipEnd=" smpte=00:00:00:27"  />
11:     <ref src= "../../Edit/0002/video02.mpg" begin=" smpte=00:05:00:22"
12:       clipBegin=" smpte=00:00:01:03"  clipEnd=" smpte=00:00:01:14"  />

13:     <!-- Clip3 -->
14:     <ref src= "../0005/video05.mpg" begin=" smpte=00:05:00:33"
15:       clipBegin=" smpte=00:10:00:15"  />
16:   </par>
17: </body>
```

F I G. 2 0

```
( START DATA REPRODUCING PROCESS )
                  │
                  ▼
┌─────────────────────────────────────┐  S31
│   READ AND INTERPRET PLAY LIST      │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐  S32
│  READ PICTURE POINTERS FOR CLIPS    │
│  TO BE REFERENCED IN PLAY LIST      │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐  S33
│  SCHEDULE DECODE STARTING            │
│  LOCATIONS AND DECODE STARTING       │
│  TIMES BASED ON PLAY LIST AND        │
│  PICTURE POINTERS                    │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐  S34
│          SELECT DECODER             │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐  S35
│  FROM PICTURE POINTERS, ACQUIRE     │
│  FILE ADDRESSES OF CLIPS TO BE      │
│  REFERENCED                         │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐  S36
│  ACQUIRE PHYSICAL ADDRESSES OF      │
│  CLIPS TO BE REFERENCED             │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐  S37
│          REPRODUCE DATA             │
└─────────────────────────────────────┘
                  │
                  ▼
  < STOP OPERATION PERFORMED ? >  S38
                  │           YES
                 NO
                  ▼
  < REPRODUCTION SET TO BE >  S39
    NO   TERMINATED ?
                  │
                 YES
                  ▼
            ( END )
```

F I G. 2 1

F I G. 2 2

GOP (m)	GOP (m+1)	GOP (m+2)	GOP (n)	GOP (o)	GOP (o+1)	GOP (o+2)

OUT$_1$/IN$_2$ OUT$_2$/IN$_3$

CLIP #1   BRIDGE CLIP   CLIP #3

F I G. 2 3

FIG.24

F I G. 2 5

START INFORMATION ADDING PROCESS

SELECT DECODERS SO THAT ALL GOP'S IN EACH CLIP ARE DECODED BY THE SAME DECODER ┤S51

ADD DECODER DESIGNATION INFORMATION ┤S52

RETURN

FIG. 26

```
 1:  <body>
 2:    <par>
 3:    <!-- Clip1 -->
 4:    <ref src= "../0001/video01.mpg"
 5:        clipBegin="smpte=00:00:00:00" clipEnd="smpte=00:05:00:00 "
 6:        decoder= "0"  />
 7:    <!-- Bridge Clip -->
 8:    <ref src= "../../Edit/0002/video02.mpg" begin="smpte=00:05:00:00"
 9:        clipBegin="smpte=00:00:00:00" clipEnd="smpte=00:00:12 "
10:        decoder= "0"  />
11:    <ref src= "../../Edit/0002/video02.mpg" begin="smpte=00:05:00:12"
12:        clipBegin="smpte=00:00:00:17" clipEnd="smpte=00:00:00:27 "
13:        decoder= "1"  />
14:    <ref src= "../../Edit/0002/video02.mpg" begin="smpte=00:05:00:22"
15:        clipBegin="smpte=00:00:01:03" clipEnd="smpte=00:00:01:14 "
16:        decoder= "0"  />
17:    <!-- Clip3 -->
18:    <ref src= "../0005/video05.mpg" begin="smpte=00:05:00:33"
19:        clipBegin="smpte=00:10:00:15" decoder= "0"  />
20:    </par>
21:  </body>
```
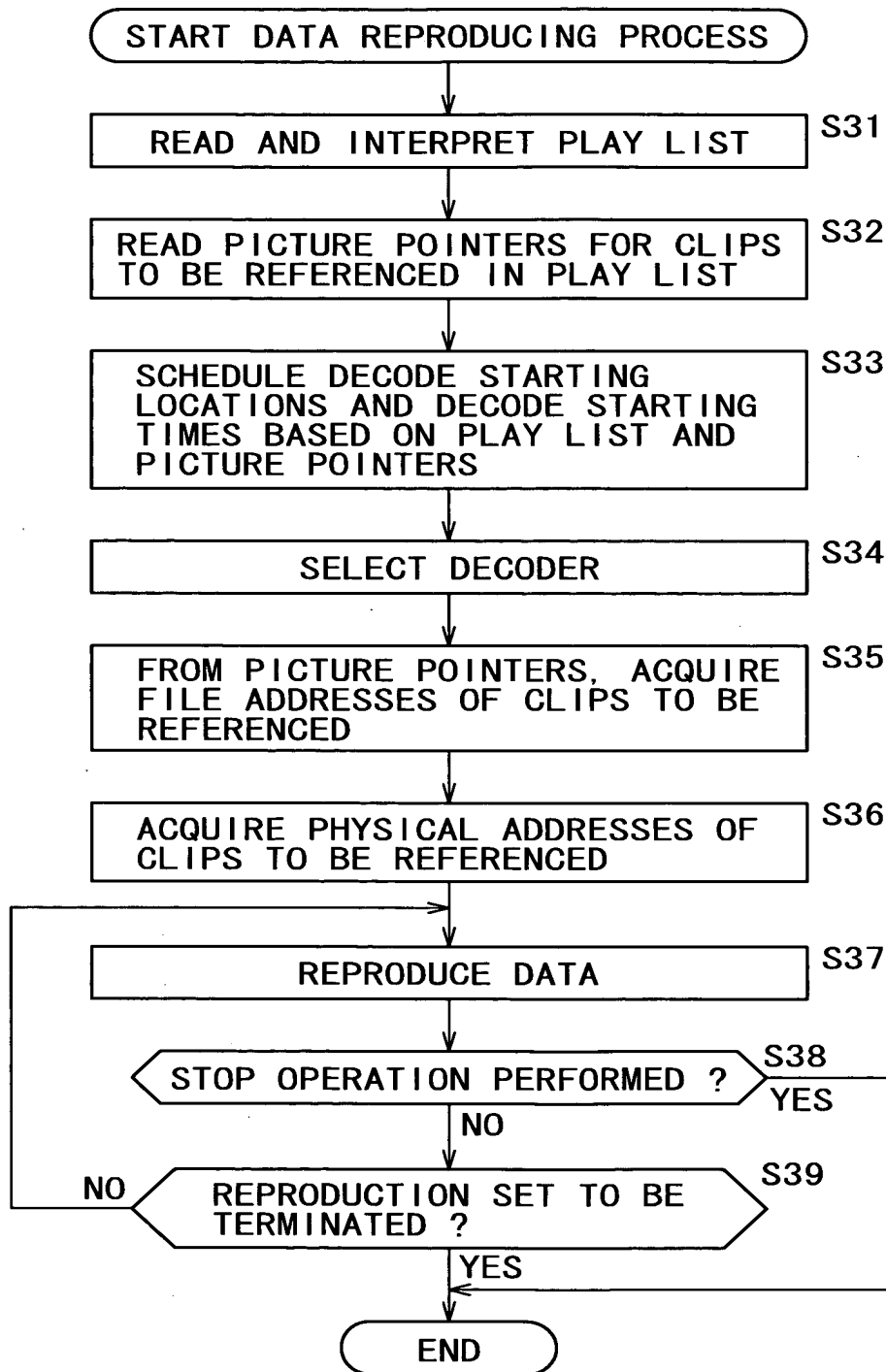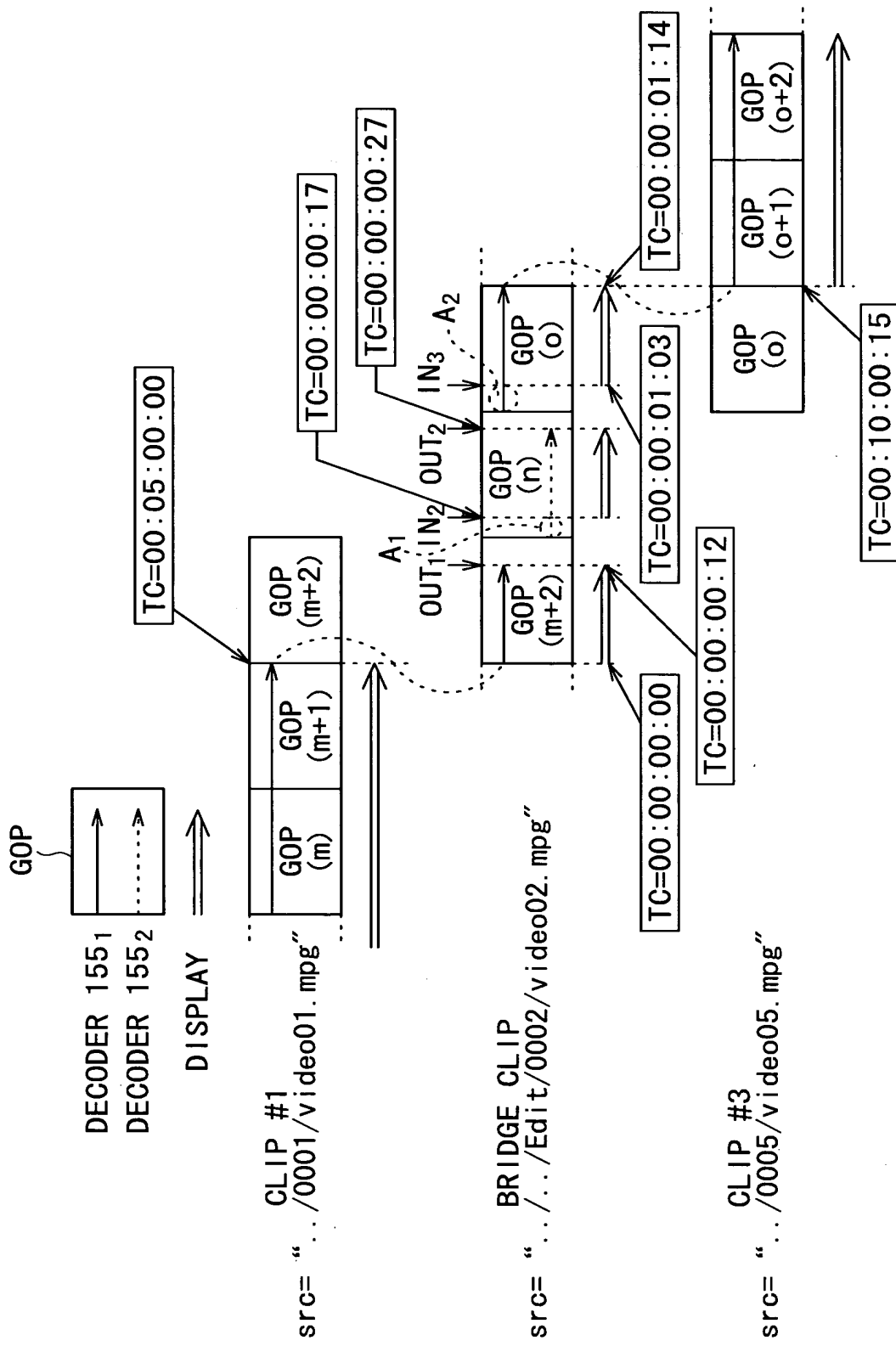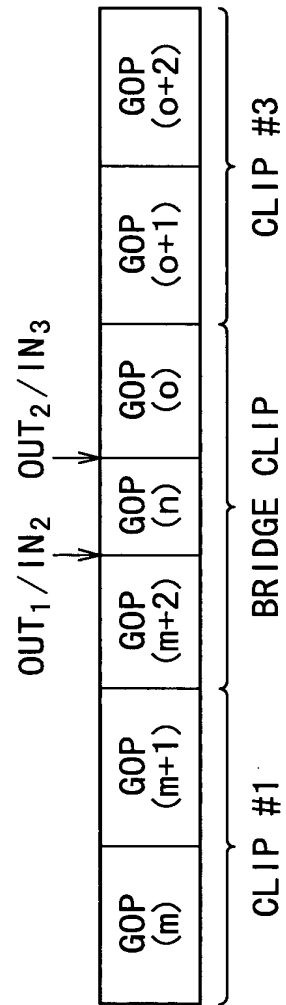
FIG. 27

```
        ( START DATA REPRODUCING PROCESS )
                        │
                        ▼
        ┌─────────────────────────────────┐   S61
        │  READ AND INTERPRET PLAY LIST   │
        └─────────────────────────────────┘
                        │
                        ▼
        ┌─────────────────────────────────┐   S62
        │ READ PICTURE POINTERS FOR CLIPS │
        │ TO BE REFERENCED IN PLAY LIST   │
        └─────────────────────────────────┘
                        │
                        ▼
        ┌─────────────────────────────────┐   S63
        │ SCHEDULE DECODE STARTING        │
        │ LOCATIONS AND DECODE STARTING   │
        │ TIMES FOR EACH DECODER BASED ON │
        │ PLAY LIST AND PICTURE POINTERS  │
        └─────────────────────────────────┘
                        │
                        ▼
        ┌─────────────────────────────────┐   S64
        │ FROM PICTURE POINTERS, ACQUIRE  │
        │ FILE ADDRESSES OF CLIPS TO BE   │
        │ REFERENCED                      │
        └─────────────────────────────────┘
                        │
                        ▼
        ┌─────────────────────────────────┐   S65
        │ ACQUIRE PHYSICAL ADDRESSES OF   │
        │ CLIPS TO BE REFERENCED          │
        └─────────────────────────────────┘
                        │
                        ▼
        ┌─────────────────────────────────┐   S66
        │ SWITCH DECODERS BASED ON        │
        │ DESCRIPTION OF PLAY LIST TO     │
        │ REPRODUCE DATA                  │
        └─────────────────────────────────┘
                        │
                        ▼
        < STOP OPERATION PERFORMED ? >   S67
                        │ NO            YES
                        ▼
        < REPRODUCTION SET TO BE >       S68
     NO   TERMINATED ?
                        │ YES
                        ▼
                    ( END )
```

FIG.28

FIG.29

F I G. 3 0

```
┌─────────────────────────────────────────────┐
│     START  INFORMATION  ADDING  PROCESS      │
└─────────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────┐  S81
│  SCHEDULE  DECODE  STARTING              │
│  LOCATIONS  AND  DECODE  STARTING        │
│  TIMES  FOR  EACH  DECODER               │
└─────────────────────────────────────────┘
                      │
                      ▼
┌─────────────────────────────────────────┐  S82
│  CREATE  PLAY  LIST  CONTAINING          │
│  ATTRIBUTE  INFORMATION  REPRESENTING    │
│  DECODE  STARTING  TIMES                 │
└─────────────────────────────────────────┘
                      │
                      ▼
              ┌───────────────┐
              │    RETURN     │
              └───────────────┘
```

F I G. 3 1

```
 1:  <body>
 2:    <par>
 3:      <!-- Clip1 -->
 4:      <ref src= "../0001/video01.mpg"
 5:         clipBegin="smpte=00:00:00:00" clipEnd="smpte=00:05:00:00 "/>

 6:      <!-- Bridge Clip -->
 7:      <ref src= "../../Edit/0002/video02.mpg" begin="smpte=00:05:00:00"
 8:         clipBegin="smpte=00:00:00:00" clipEnd="smpte=00:00:00:12 "/>
 9:      <ref src= "../../Edit/0002/video02.mpg" begin="smpte=00:05:00:12"
10:         clipBegin="smpte=00:00:00:17" clipEnd="smpte=00:00:00:27 "
11:         preDecBegin="smpte=00:00:00:15" preDecDur="1" />
12:      <ref src= "../../Edit/0002/video02.mpg" begin="smpte=00:05:00:22"
13:         clipBegin="smpte=00:00:01:03" clipEnd="smpte=00:00:01:14 "
14:         preDecBegin="smpte=00:00:01:00" preDecDur="2" />

15:      <!-- Clip3 -->
16:      <ref src= "../0005/video05.mpg" begin="smpte=00:05:00:33"
17:         clipBegin="smpte=00:10:00:15" />
18:    </par>
19:  </body>
```
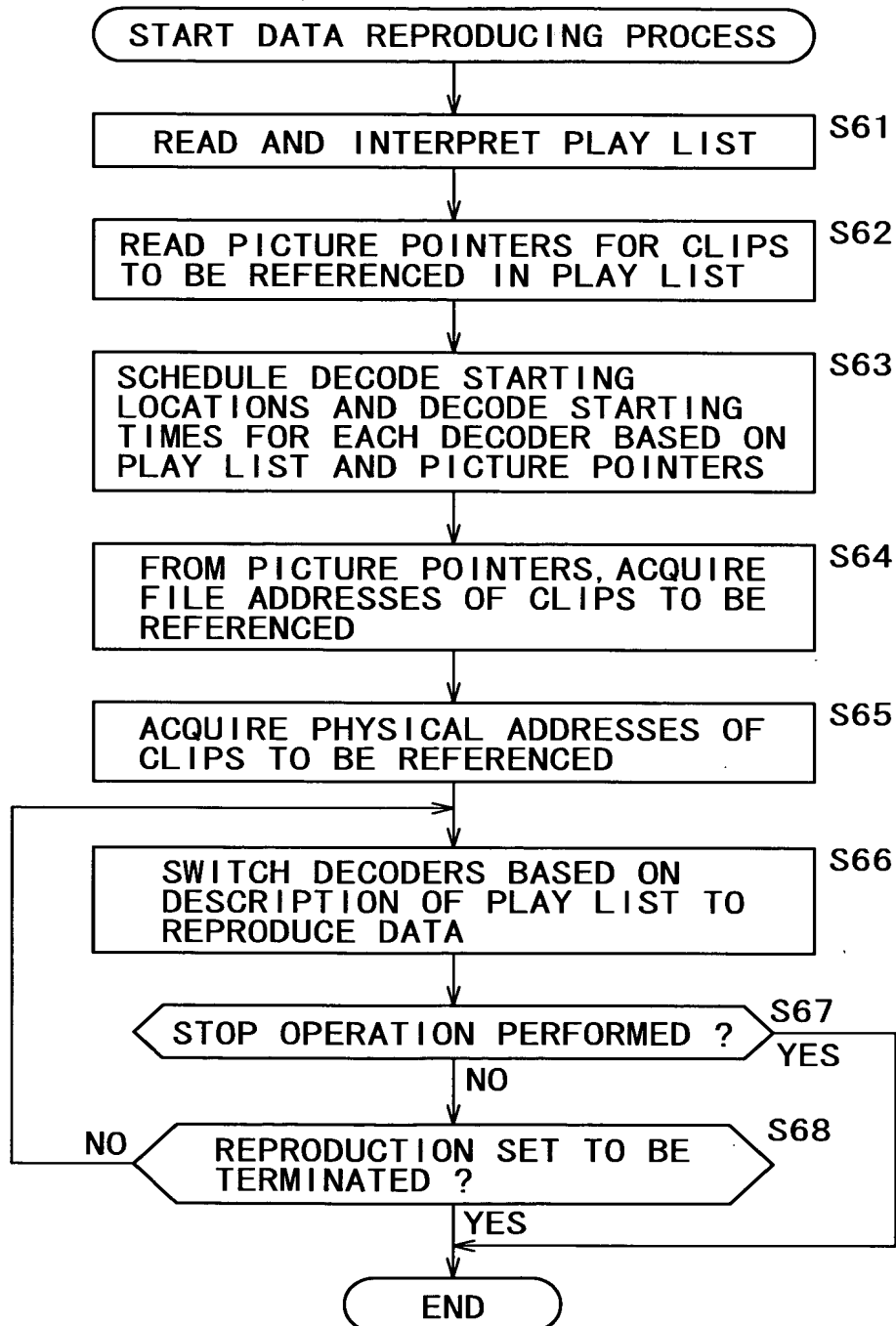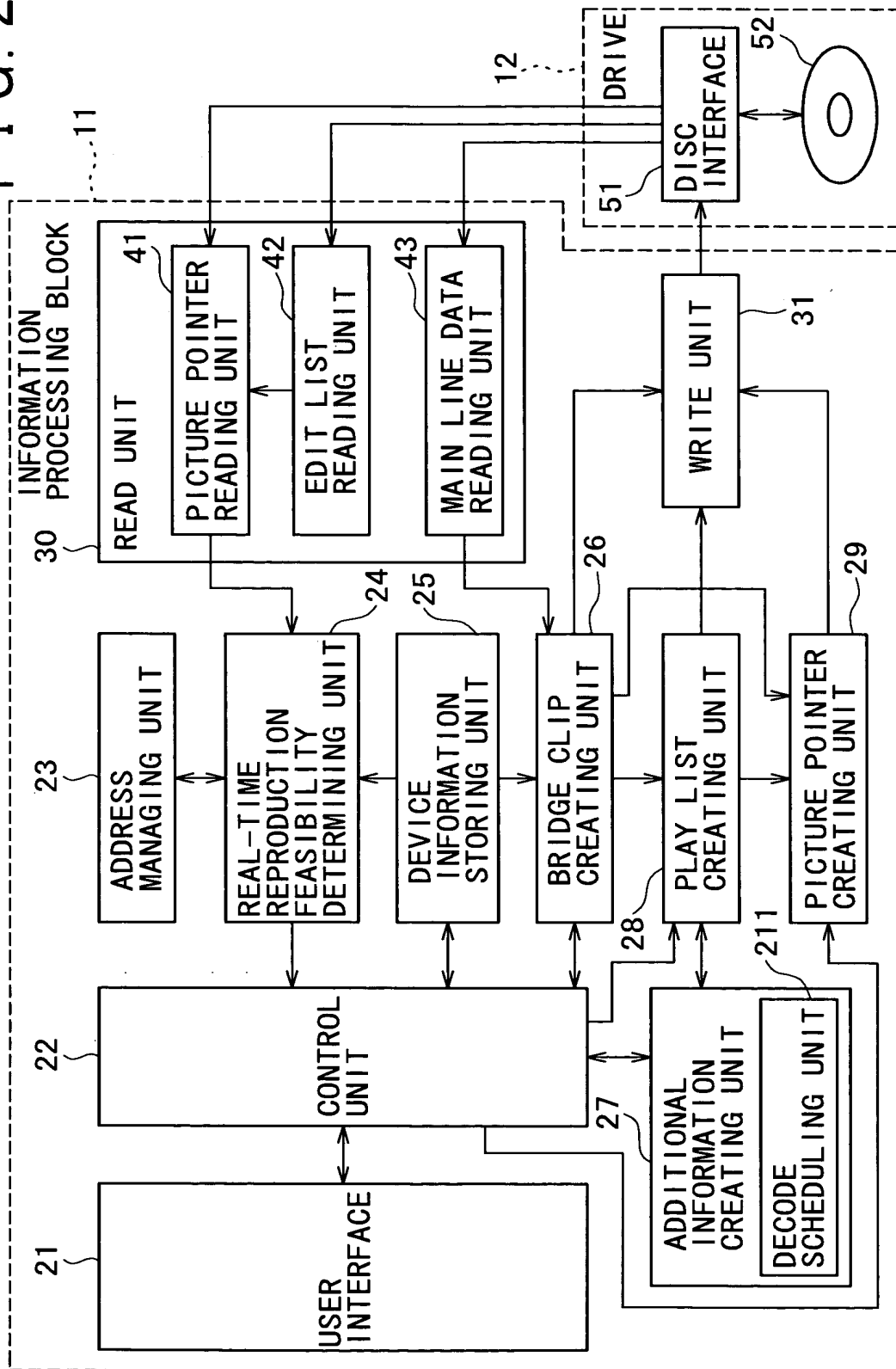
FIG. 32

```
( START DATA REPRODUCING PROCESS )
                    │
                    ▼
┌─────────────────────────────────────────┐  S91
│     READ AND INTERPRET PLAY LIST         │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐  S92
│  READ PICTURE POINTERS FOR CLIPS         │
│  TO BE REFERENCED IN PLAY LIST           │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐  S93
│  FROM PICTURE POINTERS, ACQUIRE          │
│  FILE ADDRESSES OF CLIPS TO BE           │
│  REFERENCED                              │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐  S94
│  ACQUIRE PHYSICAL ADDRESSES OF           │
│  CLIPS TO BE REFERENCED                  │
└─────────────────────────────────────────┘
                    │
                    ▼
┌─────────────────────────────────────────┐  S95
│            REPRODUCE DATA                 │
└─────────────────────────────────────────┘
                    │
                    ▼
      < preDecBegin ATTRIBUTE >  S96
      < DETECTED ?            >  NO
                    │ YES
                    ▼
┌─────────────────────────────────────────┐  S97
│            SWITCH DECODERS                │
└─────────────────────────────────────────┘
                    │
                    ▼
      < STOP OPERATION PERFORMED ? >  S98
                                      YES
                    │ NO
                    ▼
  NO  < REPRODUCTION SET TO BE >  S99
      < TERMINATED ?           >
                    │ YES
                    ▼
              (  END  )
```

F I G. 3 3

```
  ( START INFORMATION ADDING PROCESS )
                    │
                    ▼
  ┌─────────────────────────────────────┐  S111
  │ SCHEDULE DECODE STARTING             │
  │ LOCATIONS AND DECODE STARTING        │
  │ TIMES FOR EACH DECODER               │
  └─────────────────────────────────────┘
                    │
                    ▼
  ┌─────────────────────────────────────┐  S112
  │ CREATE PLAY LIST WHICH CONTAINS      │
  │ ATTRIBUTE INFORMATION REPRESENTING   │
  │ DECODE STARTING TIMES AND WHICH HAS  │
  │ FILE ADDRESSES DESIGNATING CLIPS     │
  │ TO BE REFERENCED                     │
  └─────────────────────────────────────┘
                    │
                    ▼
              ( RETURN )
```

F I G . 3 4
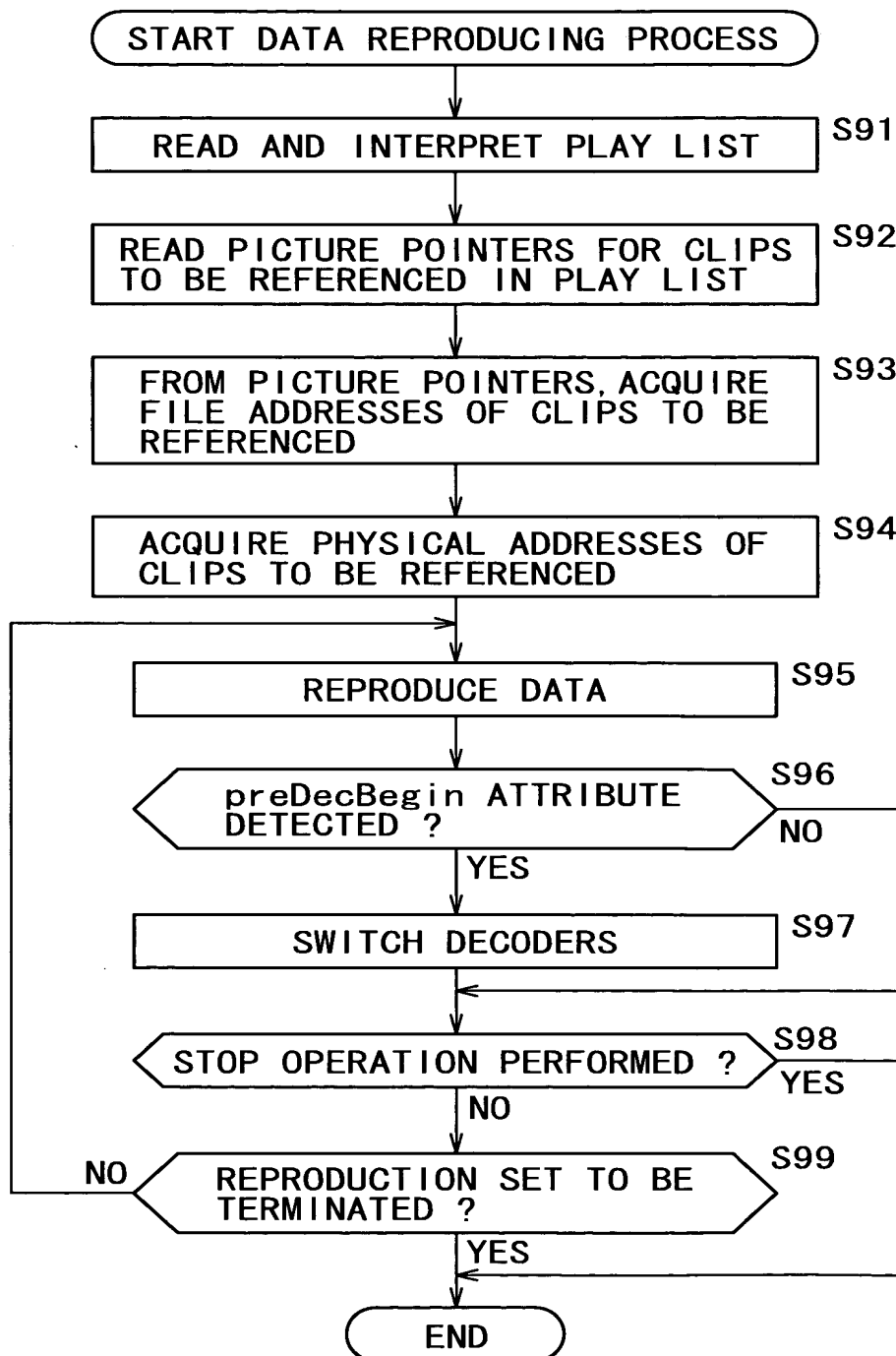
```
 1:  <body>
 2:  <par>
 3:  <!-- Clip1 -->
 4:  <ref src= "../0001/video01.mpg"
 5:       clipBegin= "faddress=0x00000" clipEnd= "faddress=0x002fa "/>

 6:  <!-- Bridge Clip -->
 7:  <ref src= "../../Edit/0002/video02.mpg" begin="smpte=00:05:00:00"
 8:       clipBegin= "faddress=0x00000" clipEnd= "faddress=0x001bc" />
 9:  <ref src= "../../Edit/0002/video02.mpg" begin="smpte=00:05:00:12"
10:       clipBegin= "faddress=0x0045d" clipEnd= "faddress=0x00084f"
11:       preDecBegin= "faddress=0x00421" preDecDur="1" />
12:  <ref src= "../../Edit/0002/video02.mpg" begin="smpte=00:05:00:22"
13:       clipBegin= "faddress=0x00a01" clipEnd= "faddress=0x00df1 "
14:       preDecBegin= "faddress=0x00970" preDecDur="2" />

15:  <!-- Clip3 -->
16:  <ref src= "../0005/video05.mpg" begin="smpte=00:05:00:33"
17:       clipBegin= "faddress=0x00ec0" decoder="0" />
18:  </par>
19:  </body>
```
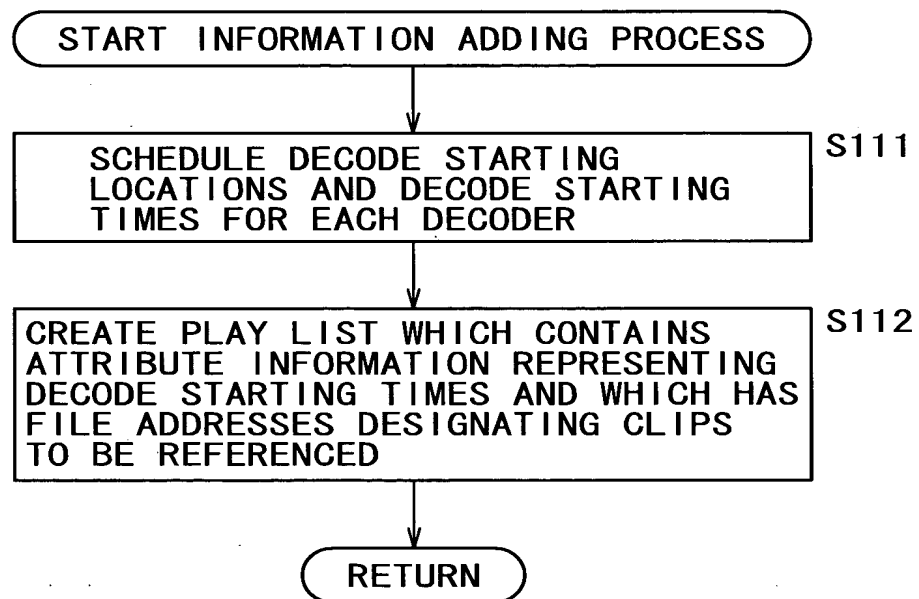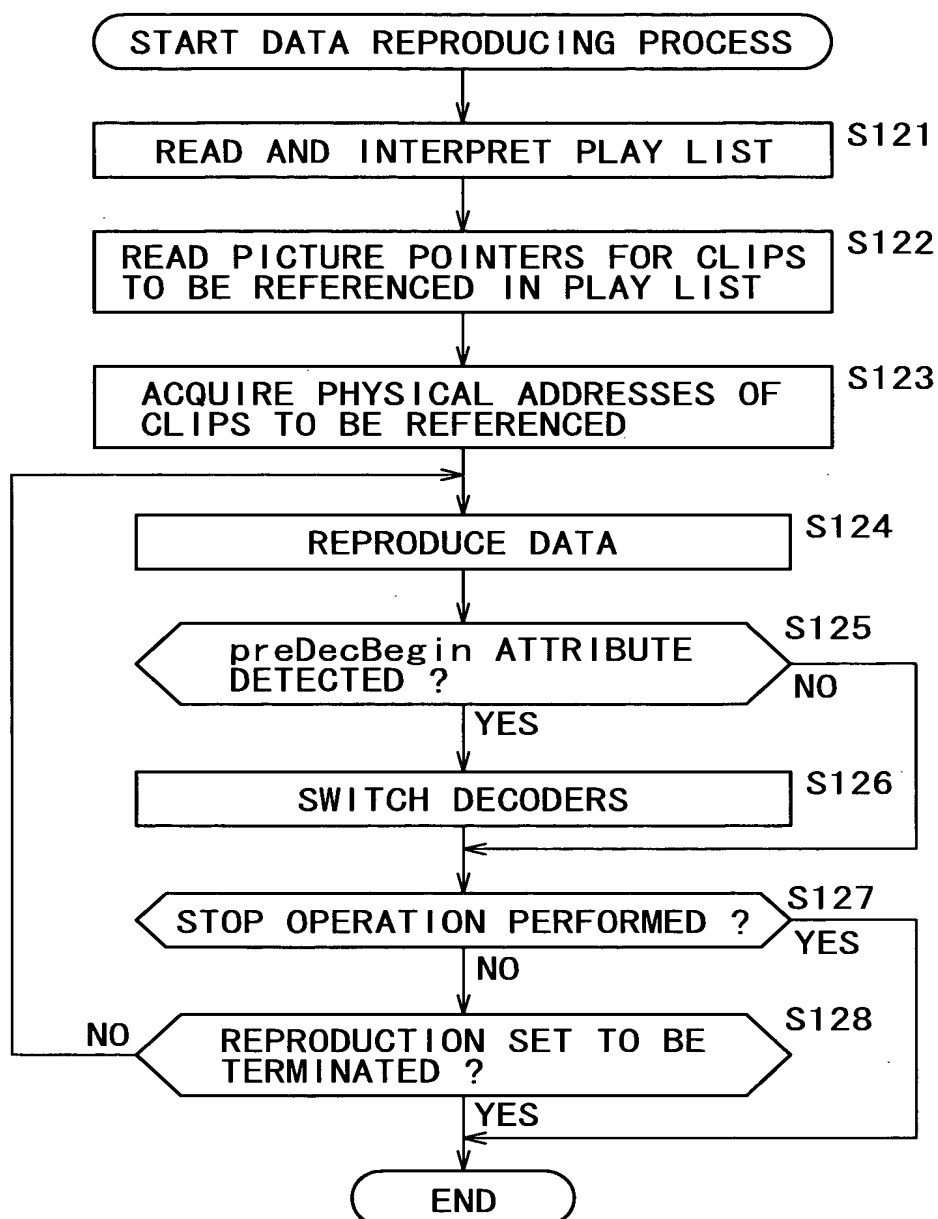
F I G. 3 5

```
( START DATA REPRODUCING PROCESS )
              │
              ▼
┌─────────────────────────────────────┐ S121
│  READ AND INTERPRET PLAY LIST       │
└─────────────────────────────────────┘
              │
              ▼
┌─────────────────────────────────────┐ S122
│  READ PICTURE POINTERS FOR CLIPS    │
│  TO BE REFERENCED IN PLAY LIST      │
└─────────────────────────────────────┘
              │
              ▼
┌─────────────────────────────────────┐ S123
│  ACQUIRE PHYSICAL ADDRESSES OF      │
│  CLIPS TO BE REFERENCED             │
└─────────────────────────────────────┘
              │
              ▼
┌─────────────────────────────────────┐ S124
│           REPRODUCE DATA            │
└─────────────────────────────────────┘
              │
              ▼
      preDecBegin ATTRIBUTE            S125
      DETECTED ?                       NO
              │ YES
              ▼
┌─────────────────────────────────────┐ S126
│          SWITCH DECODERS            │
└─────────────────────────────────────┘
              │
              ▼
      STOP OPERATION PERFORMED ?       S127
              │ NO                     YES
              ▼
      REPRODUCTION SET TO BE           S128
NO    TERMINATED ?
              │ YES
              ▼
           ( END )
```

F I G. 3 6

221

1   101

| DISC APPARATUS | ⟷ | REPRODUCING APPARATUS |